For this purpose, a VDSL transmission system is taken. A major problem with VDSL transmissions is the existence of very narrow bands, so-called HAM bands, that are occupied by amateur radio. The HAM bands are located in the ranges of 1.81 - 2.00 MHz, 3.50 - 3.80 MHz and 7.00 - 7.10 MHz. Within these bands, the transmitted power density spectrum has to be reduced by 20 dB. In order to reduce the power density spectrum within these bands, it is not sufficient not to transmit any information in the subchannels overlapping the HAM bands. A series of neighboring channels must be charged with zero in order to achieve the desired reduction of the power density spectrum. The following examples show the applicability of the method according to the invention of reducing the number of the subchannels charged with zero.

All the systems use a channel number of M = 512. The length of the Guard Intervals or of the cyclical prefix is 32.

The first simulation relates to a system that does not use any specific method of suppressing the power density spectrum within the HAM bands. The required suppression is achieved through some sounds charged with zero. A cyclical prefix is used. The power density spectrum and the required zero charged sounds of the system A are indicated in Figs. 35 and 36 and in the chart according to Fig. 34.

In the second simulation, the required suppression of the power density spectrum within the HAM band is achieved by the statistical method according to the invention. System B uses a Guard Interval. The power density spectrum and the zero charged sounds are indicated in the Figs. 38 and 39 and in the chart according to Fig. 37.

System C corresponds to a system that uses the deterministic method according to the invention. Figs. 41, 42 and the chart according to Fig. 40 show the power density spectrum and the zero charged sounds.

The system D employs the statistical method according to the invention for the case in which a cyclical prefix is used. The results of the simulation are summed up in the chart according to Fig. 43, the power density spectrum is shown in the Figs. 44, 45.

On comparing the charts according to the Figs. 34, 37, 40 and 43 it can be visualized that the systems that use the method according to the invention require the same number of zero charged sounds in order to achieve the desired suppression of the power density spectrum within the HAM bands. System A, which does not use a method according to the invention, needs 35 more channels to achieve the same goal than the systems B and C. A comparison of the power density spectra of the systems B and C shows that they are almost completely equivalent. As already mentioned above, the system B is less complex than system C so that the statistical system will be preferred. The behavior of system D, which uses a cyclical prefix instead of a Guard Interval, is just as good as the one of system B.

The method according to the invention may also be used for a system with a cyclical prefix. On comparing the suppression of the power density spectrum of the systems A and D, which are both used for the cyclical prefix, it may be seen that system A very poorly meets the requirements, whereas system D yields very good results.

CLAIMS

1. Method of suppressing narrow frequency bands in fade-out ranges during transmission of data by means of a multiple carrier method, e.g. DMT (Discrete Multitone) in which a predetermined broad frequency band is divided into a plurality of subchannels having subcarriers assigned thereto and in which the data to be transmitted are modulated in the transmitter with Inverse Discrete Fourier Transform (IDFT) and are demodulated in the receiver with Discrete Fourier Transform (DFT), each subchannel being thus provided in the spectrum with a major lobe and several side lobes occurring between nearby subcarriers, all the subcarriers contained in this narrow fade-out range and further subcarriers adjacent the narrow fade-out range being given a zero charge for suppressing at least a narrow fade-out frequency range, **wherein** a pulse for compensating the side lobes occurring in the fade-out range is additionally transmitted for each frequency range extending between the subcarriers contained within the fade-out range and the thereto adjacent subcarriers having a zero charge respectively, said pulse being provided with a frequency spectrum which resembles the side lobes occurring in the intermediate ranges and which is modulated according to the data values of the side lobes occurring in the corresponding intermediate ranges, the compensating pulse(s) being transmitted orthogonal to the information transmitting subcarriers.

2. Method according to claim 1, **wherein** the amplitude and the phase of the side lobe spectra for the fade-out range be calculated from the data values of a number of subchannels that may be predetermined and the compensation pulse assigned to each intermediate frequency range is determined by adding the individual complex side lobe spectra that have been calculated for this purpose and that, prior to transmission, the thus determined compensation pulse(s) be superimposed to the transmitter signal in such a